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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/536,618	03/28/2000	Toyokazu Fujii	43889-929	5999

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MCDERMOTT WILL & EMERY
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

PHAM, HOAI V

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/536,618

Applicant(s)

FUJII ET AL.

Examiner

Hoai V Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,6,7,10-13 and 34-36 is/are pending in the application.
- 4a) Of the above claim(s) 35-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,6,7,10-13 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/018,181.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Newly submitted claims 35-36 and new limitation in claim 1 "a third insulating film... predetermined conditions" are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Applicant has been elected for prosecution on the merits Embodiment 3 as shown in figures 5 and 6A-6D, claims 1, 4, 6, 7, 10, 12 and 13, on Paper # 6, drawn to a structure of a cylindrical stacked DRAM cell. The new claims 35-36 and new limitation in claim 1 are Embodiment 1 as shown in figures 1 and 2A-2D, drawn to a structure of a semiconductor device having a polycide interconnection. Therefore, claims 35-36 and new limitation in claim 1 are not under consideration. Since they are drawn to non-elected subject matter.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 35-36 and new limitation in claim 1 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "said second insulating film defining said capacitor insulating film" is unclear since in figure 5, the second insulating film (18) is not the capacitor insulating film.

The phrase "said supporting film comprising an insulating film interposed between said interlayer insulating film and said capacitor insulating film" is unclear. Is the insulating film the same with the supporting film? Since in figure 5, the supporting film is layer (17).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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6. Claims 1, 7, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee [U.S. Pat. 5,936,272].

Lee (figure 4, cols. 7-10) discloses a semiconductor device comprising:

a substrate (100) having a semiconductor region;

a first insulating film (125) formed on the semiconductor region;

a second insulating film (136) formed on the first insulating film; and

a supporting film (135) formed between the first and second insulating films.

With respect to claim 7, Lee discloses that the second insulating film comprises a silicon nitride film (see col. 8, lines 52-54).

With respect to claim 12, Lee discloses that the first insulating film comprises a BPSG film (see col. 8, lines 29-35).

With respect to claim 13, Lee discloses that the supporting film comprises a silicon oxide film (see col. 8, lines 49-50).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 4, 6, 10, 11 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee [U.S. Pat. 5,936,272].

With respect to claim 4, as best understood, Lee (figure 4, cols. 7-10) discloses the semiconductor device is a stacked DRAM cell comprising:

- on a gate (70) on the semiconductor region;

- an impurity diffusion layer (118, 119) in a region sideways of the gate;

- an interlayer insulating film (125) formed on the gate;

- a storage node (140,160) filling an opening formed in the interlayer insulating film and extending over apart of the interlayer insulating film;

Lee does not show a capacitor insulating film and a plate electrode formed for coverage over the storage node. However, the capacitor insulating film and the plate electrode formed for coverage over the storage node are well-known to those skilled in the art (see col.10, lines 1-4).

With respect to claims 6 and 10, Lee shows that the storage node is a cylindrical storage node and an etching stopper film (136, silicon nitride) is overlying the supporting film and underlying the storage node (see figure 4G).

With respect to claim 11, Lee shows that the storage node is a cylindrical storage node and the supporting film comprises a TEOS (see col. 8, lines 49-50).

With respect to claim 34, Lee does not mention the impurities in the BPSG film is 3.0 wt% for phosphorous and boron, as claimed by Applicant. However, the impurities range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, it appears that these changes produce no functional differences and therefore would have been obvious. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Response to Arguments

10. Applicant's arguments filed 12/21/01 have been fully considered but they are not persuasive.

In response to applicant's argument that Lee fails to disclose or suggest "a third insulating film formed at a higher level than the first insulating film". However, this limitation belongs to the figures 1 and 2A-2D, is not under consideration since they are drawn to non-elected subject matter.

In response to applicant's argument that Lee fails to disclose or suggest "the claimed supporting film formed between the first insulating film and the second insulating film". However, Lee shows a supporting film (135) formed between the first insulating film (125) and second insulating film (136) (see figure 4C, col. 8, lines 29-55). Therefore, the rejection is proper.

In response to applicant's argument that Lee (O₃-TEOS layer 135) is not a silicon oxide film. This argument is not persuasive since O₃-TEOS is a silicon oxide film 9 (see the abstract of U.S. Pat. 5,916,694).

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V Pham whose telephone number is 703-308-6173. The examiner can normally be reached on 6:30A.M. - 6:00P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

HP
Hoai Pham
March 8, 2002



OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800